UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,022	01/29/2004	Yoji Nakatani	501.43385X00	2664

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DILLER, JESSE DAVID

ART UNIT	PAPER NUMBER
2187	

DATE MAILED: 09/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/766,022	NAKATANI ET AL.
	Examiner	Art Unit	
	Jesse Diller	2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>21 June 2006</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application..

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *2-5,7-10 and 12-15* is/are allowed.

6)☒ Claim(s) *1,6,11 and 16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

Response to Amendment

1.   Examiner acknowledges receipt of the amendment in response to the office

action dated 03/21/2006, which amendment was received 06/21/2006.   At this point,

claims 1, 6, 8, and 11 have been amended. Claims 1-16 are pending in the application.

Response to Arguments

2.   **Applicant's arguments filed with respect to the 35 USC § 102 rejections of**

claims 1, 6, 11, and 16 by Srinivasan have been fully considered, but are not

persuasive.

3.   Applicants claim that the reference does not teach the limitation added by

amendment. However, see the rejections below.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of
> making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the
> art to which it pertains, or with which it is most nearly connected, to make and use the same and shall
> set forth the best mode contemplated by the inventor of carrying out his invention.

4.   **Claim 6 is rejected under 35 U.S.C. 112, first paragraph**, as failing to comply

with the enablement requirement. The claim(s) contains subject matter which was not

described in the specification in such a way as to enable one skilled in the art to which it

pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 6 recites a second file system included in a storage system; however, the

specification only enables a single file system in a storage system. for purposes of

examination, however, claim 6 has been taken to mirror claim 1: "without using another

file server which is connected to said another storage system".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5.   **Claims 1, 6, 11, and 16 are rejected under 35 U.S.C. 102(e) as being**

anticipated by Srinivasan et al., US 6,823,336.

6.   **As for claim 1, Srinivasan teaches**

   •   A storage system comprising:

   •   a disk system having:

         o   at least one disk to store data (26, 28, Fig. 1);

         o   a disk control unit to control writing and reading of data to and from said at

             least one disk (25, 27, Fig. 1); and

         o   a disk cache for transmitting and receiving data to and from said at least

             one disk (145-148, Fig. 9);

- a file server, connected to said disk system (i.e., 111, Fig. 8; 181, Fig. 13) including

  - a Central Processing Unit (CPU) and a main memory to store programs and data for said CPU (inherent in data mover 111, Fig. 8. see, for instance, Col. 5, lines 30-35, which incorporate by reference Ofek, US 5,893,140 as a description of the hardware in the system. Col. 4, lines 39-65 of Ofek, discusses a detailed view of the data mover, which Srinivasan shows as 111, Fig. 8),

  - a network interface to be coupled to clients through a network (Col. 17, lines 35-65);

- interfaces for sending and receiving data to and from other storage systems through a communication link (22, Fig. 1);

- wherein said main memory includes

  - a file system-processing unit managing storage areas of said at least one disk, so that files are correlated with data locations on said at least one disk (116-117, Fig. 9; see also 191-193, 201-203, Fig. 13), and

  - a file-system cache to be used by said file system-processing unit (see 194, 204, Fig. 13);

- wherein said disk control unit receives data of a file that has been updated in another storage system and a history of file-management information from another disk system through said communication link (see Figs. 10-11; the delta sets received are combinations of the data and metadata; Col. 11, lines 20-60)

without using another file server connected to said another disk system (see Fig. 9; server 111 is not used to store data in 142) and stores the received data of a file and the history of file-management information on the disk system (141-142, Fig. 9), and

- wherein said file server refers to the history of the file-management information on the disk system and updates file-management information in said file-system cache in accordance with the update of the file performed in said another storage system (Col. 12, lines 1-35; both filesystems 116-117 are active, Col. 15, lines 38-40, 55-67; therefore, when the data updates in the caches 145-148 are applied to the disks 141-142, the other filesystem must be updated with the metadata from the caches).

7.   **As for claim 16, Srinivasan further teaches:**

- when said disk-control unit receives a read request from a client coupled to the storage system, the storage system refers to the file-management information updated in said file-system cache and reads. from the disk, the contents of the updated file and transfers the contents to said client (see Col. 17, lines 13-24; also see read data, 143-134, Fig. 9).

8.   **As for claim 6, Srinivasan teaches** a file reference method of a storage system, said storage system which includes:

- a disk system having:
    - at least one disk to store data (26, 28, Fig. 1);

- o a disk control unit to control writing and reading of data to and from said at least one disk (25, 27, Fig. 1); and

- o a disk cache for transmitting and receiving data to and from said at least one disk (145-148, Fig. 9);

- a file server, connected to said disk system (i.e., 111, Fig. 8; 181, Fig. 13) including

  - o a Central Processing Unit (CPU) and a main memory to store programs and data for said CPU (inherent in data mover 111, Fig. 8. see, for instance, Col. 5, lines 30-35, which incorporate by reference Ofek, US 5,893,140 as a description of the hardware in the system. Col. 4, lines 39-65 of Ofek, discusses a detailed view of the data mover, which Srinivasan shows as 111, Fig. 8),

  - o a network interface to be coupled to clients through a network (Col. 17, lines 35-65);

- interfaces for sending and receiving data to and from other storage systems through a communication link (22, Fig. 1);

- wherein said main memory includes

  - o a file system-processing unit managing storage areas of said at least one disk, so that files are correlated with data locations on said at least one disk (116-117, Fig. 9; see also 191-193, 201-203, Fig. 13), and

  - o a file-system cache to be used by said file system-processing unit (see 194, 204, Fig. 13);

- o said FS processing unit and cache being part of a file server connected to
  at least one disk

- said file-reference method comprising;

  - o a storing step in which said disk-control unit receives contents of a file that
    has been updated in another storage system (see "write data", Fig. 9) and
    a history of file- management information through said communication link
    from said other storage system (22, Fig. 1) and stores the contents of a
    file and the history of file- management information on a disk (see Fig. 9;
    the secondary data storage system receives "delta chunks" which include
    both the data of the file changed in the other storage system and
    metadata for the filesystem update; Col. 11, lines 20-60; see also Col. 16,
    line 65 to Col. 17, line 3) without using another file server connected to
    said another disk system (see Fig. 9; server 111 is not used to store data
    in 142);

  - o a monitoring step in which said file server refers to the history of the file-
    management information stored in said disk (see, for instance, Col. 15,
    lines 1-15; Col. 15, lines 42-57; some form of referrance is inherent in this
    update process, as the file system clearly uses the metadata received
    from the other storage system to update the filesystem; therefore, it must
    refer to said metadata, which reads on the referring step);

  - o an updating step in which, based on a reference to the history of the file-
    management information, said file server updates the file-management

information in said file-system cache in accordance with the update of the

file in said other storage system (Col. 12, lines 1-35; both filesystems 116-

117 are active, Col. 15, lines 38-40, 55-67; therefore, when the data

updates in the caches 145-148 are applied to the disks 141-142, the other

filesystem must be updated with the metadata from the caches; see also

Col. 17, lines 1-3; the stored data is "replayed" to update the filesystem);

and

- o a transfer step in which, when said disk-control unit receives a read

  request from a client coupled to the storage system, the storage system

  refers to the file-management information updated in said file-system

  cache and reads. from the disk, the contents of the updated file and

  transfers the contents to said client (see Col. 17, lines 13-24; also see

  read data, 143-134, Fig. 9).

9.   **As for claim 11, Srinivasan teaches** a network system comprising

- a first storage system and a second storage system (110, 113, Fig. 9), wherein

  each storage system comprises:

- a disk system having:

  - o at least one disk to store data (26, 28, Fig. 1);

- o   a disk control unit to control writing and reading of data to and from said at

    least one disk (25, 27, Fig. 1); and

- o   a disk cache for transmitting and receiving data to and from said at least

    one disk (145-148, Fig. 9);

- a file server, connected to said disk system (i.e., 111, Fig. 8; 181, Fig. 13)

including

- o   a Central Processing Unit (CPU) and a main memory to store programs

    and data for said CPU (inherent in data mover 111, Fig. 8. See, for

    instance, Col. 5, lines 30-35, which incorporate by reference Ofek, US

    5,893,140 as a description of the hardware in the system. Col. 4, lines 39-

    65 of Ofek, discusses a detailed view of the data mover, which Srinivasan

    shows as 111, Fig. 8),

- o   a network interface to be coupled to clients through a network (Col. 17,

    lines 35-65);

- interfaces for sending and receiving data to and from other storage systems

through a communication link (22, Fig. 1);

- wherein each main memory of the first and second storage systems includes

- o   a file system-processing unit managing storage areas of said at least one

    disk, so that files are correlated with data locations on said at least one

    disk (116-117, Fig. 9; see also 191-193, 201-203, Fig. 13), and

- o   a file-system cache to be used by said file system-processing unit (see

    194, 204, Fig. 13);

- wherein the disk-control unit of said first storage system receives contents of a file that has been updated in the second storage system (see "write data", Fig. 9) and a history of file- management information through said communication link (22, Fig. 1) without using the second file server connected to said second disk system (see Fig. 9; server 111 is not used to store data in 142) and stores the contents of a file and the history of file- management information on a disk (see Fig. 9; the secondary data storage system receives "delta chunks" which include both the data of the file changed in the other storage system and metadata for the filesystem update; Col. 11, lines 20-60; see also Col. 16, line 65 to Col. 17, line 3);

- wherein the file server of said first storage system refers to the history of the file-management information on the disk (see, for instance, Col. 15, lines 1-15; Col. 15, lines 42-57; some form of referrance is inherent in this update process, as the file system clearly uses the metadata received from the other storage system to update the filesystem; therefore, it must refer to said metadata, which reads on the referring step) and updates the file- management information in the file-system cache of said first storage system in accordance with the update of the file in said second storage system (Col. 12, lines 1-35; both filesystems 116-117 are active, Col. 15, lines 38-40, 55-67; therefore, when the data updates in the caches 145-148 are applied to the disks 141-142, the other filesystem must be updated with the metadata from the caches; see also Col. 17, lines 1-3; the stored data is "replayed" to update the filesystem); and

- wherein, when said first storage system receives a read request from a client,

  said first storage system refers to the file-management information updated in

  said file-system cache reads, from the disk, the contents of the update file

  received from said second storage system, and transfers the contents to said

  client (see Col. 17, lines 13-24; also see read data, 143-134, Fig. 9).

Allowable Subject Matter

Claims 2-5, 7-10, 12-15 are allowed. The reasons for allowance for these claims
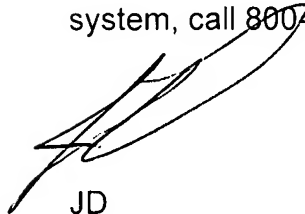
may be found in a prior action.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jesse Diller whose telephone number is (571) 272-

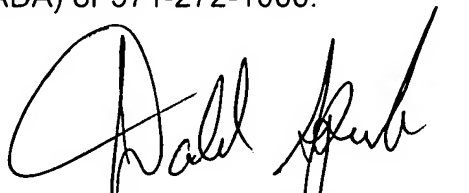4173. The examiner can normally be reached on 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Donald Sparks can be reached on (571) 272-4201. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

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USPTO Customer Service Representative or access to the automated information

system, call 800/786-9199 (IN USA OR CANADA) or 571-272-1000.

JD

**DONALD SPARKS
SUPERVISORY PATENT EXAMINER**